

BZP/JONES



BZP (Jones)

Q96799-



22101138345





3/6  
0/5

THOMAS WHARTON JONES, F.R.S.

BY

SIR RICKMAN J. GODLEE, BT.

---

1921





# THOMAS WHARTON JONES, F.R.S.

BY

SIR RICKMAN J. GODLEE, B.T.

*Reprinted from* THE BRITISH JOURNAL OF OPHTHALMOLOGY,  
*March and April, 1921.*

---

LONDON :  
GEO. PULMAN & SONS, LTD.,  
THAYER STREET, W.1.  
1921.

JONES, Thomas Whitson [1909-91]

NEUROLOGY - 19 cent.

OPHTHALMOLOGY - 19 cent.

BZP (Jones)





## PREFACE

---

No life of Wharton Jones has yet been written, though, as the following pages show, he was one of the most prominent and original explorers in the field of Physiology at the time when that science was beginning to extend itself beyond the narrow limits that had confined it up to the end of the eighteenth century.

The material at my disposal was too scanty to form the basis of a full biography; and, indeed, his retiring disposition kept him, for the most part, secluded from such incidents as would be of general interest. I have therefore attempted only a sketch—not a picture—of the man, and given such a record of his writings as will enable those who desire to do so to consult them in the original form in which they were published. If the account of his ophthalmological work appears to be out of proportion to the rest, the reader is asked to bear in mind that this memoir is a reprint of an article which appeared in the *British Journal of Ophthalmology*, to the Editorial Committee of which I am indebted for permission to reproduce it in the present form.

R. J. G.

*June, 1921.*



Digitized by the Internet Archive  
in 2018 with funding from  
Wellcome Library

<https://archive.org/details/b29980574>







THOMAS WHARTON JONES



## THOMAS WHARTON JONES

BY

SIR RICKMAN J. GODLEE, BT., K.C.V.O.,

EMERITUS PROFESSOR OF CLINICAL SURGERY, UNIVERSITY COLLEGE, LONDON.

THE biographer of Wharton Jones should be a physiologist and an ophthalmic surgeon, and to do him full justice it would perhaps be best if they had not met in the flesh. I undertook to write a short life of him without these qualifications, and without having known him intimately, simply because I was asked to do so by the Editorial Committee of the BRITISH JOURNAL OF OPHTHALMOLOGY.

He was indeed a familiar figure when I was a student, but this is a disadvantage, because it may make me emphasize his foibles at the expense of his great qualities. Medical students are poor judges of the characters of their senior teachers, and opinions formed at that impressionable time are hard to modify. Such as they are, however, they have their value, so I will begin by describing his appearance and saying what we thought of him in the seventies of the last century.

The admirable portrait shows, or suggests, as well as any description, his diminutive figure, clad in rather rusty broad-cloth, his quaint pallid face, piercing eyes, long flat nose and long upper lip, and the wisp of straight iron grey hair hanging down on each side from below his skull cap; and if you substitute for this a tall silk hat and a very long overcoat for out-of-doors the picture is complete. Like his friend and colleague Robert Edmund Grant, the Professor of Comparative Anatomy, whose every day attire was a dress coat, he seemed to belong to an older period than the rest of our teachers, much older certainly than that of their contemporary Sharpey, and we called him—can you wonder?—"Mummy Jones."

In those days attendance on the lectures of the Professor of Ophthalmic Medicine and Surgery was not compulsory, so not many of us were familiar with his Scottish brogue which was stronger than might have been expected in one whose father was a Welshman and who boasted of his ancient English descent and of his old Hibernian kinsmen. And those who went found the lectures unattractive. They were read word for word from a complete manuscript of the course, just as much as could be got through in an hour without reference to the stage he had reached in the subject he was dealing with.

For my own part, I put off these matters for a day that never arrived, and I saw no more of him till, as a young assistant surgeon,



I met him from time to time in the Board Room of the Hospital. There was then no retiring age, and he was about 70, but he was always ready for a long disquisition with a junior colleague on such unlikely topics as the special virtues of particular jams, or the superiority of his leather overshoes of Russian pattern to goloshes. Perhaps it was because he was by this time a very solitary man. His real life's work was over, and, when he reached his little home in George Street, Hanover Square, it was not to make or describe more epoch-making discoveries, or to compile laborious treatises or text-books, but to write counter-blasts against the Darwinian theory of evolution, or to enter into angry polemics about his grandmother's genealogy.

When he first came to London in 1838, he wrote from Newman Street, Oxford Street, but he must soon have moved to George Street. Probably his mother lived with him. She died there in 1862. No. 35 is the smallest of the small houses at the narrow southern end of what was once a fashionable street,\* lined with noble mansions above St. George's Church, where it broadens out into half the width of Hanover Square. It is indeed a ridiculously small house—simply four little rooms, one above another, and a narrow staircase. If it ever had back rooms they were absorbed at least as long ago as 1760 by the continuation of a shop or house in Conduit Street. Here our lonely old bachelor lived with a poor married couple whom he provided with quarters in return for their domestic service.

The pedigree of which he was so proud, and which he studied with the same accuracy and persistence as he had devoted to the solution of scientific problems, was not his father's. That only goes back three generations to one Thomas Jones of Oswestry. It was that of his maternal grandmother, which he traced through Philipases and Ellistons to the middle of the sixteenth century, and by means of their more or less authentic ancestors, Aleston, Aliston, or Alyston, he went in fancy even further back than Domesday Book to an Essex Alestan, a freeman whose lands were confiscated at the time of the Norman Conquest.

Wharton Jones was the last representative of this ancient family, and he brooded over a common grievance, that money and heirlooms to which he seemed to have a sort of moral claim had passed away into another family. They had been inherited by his great aunt by marriage, who was a Whatman. The Whatmans were the well known Kent paper makers. Jones entreated James Whatman, courteously at first, to give him the portrait of Martha Elliston, his great-grandmother, but without success; and an acrimonious

---

\*It was the place of assembly of the Four-in-hand Club. Lady Mary Wortley Montagu died at a "harpsicord house" in George Street in 1762. Richard Brinsley Sheridan lived there in 1803, Madame de Stael in 1813, and Phillips, R.A., 1805-1845.



correspondence\* went on for several years, which was printed, and, for all I know, published, as well as a letter to Ulster King of Arms and a paper in the "Herald and Genealogist." These should be studied by those who would appreciate all the sides of the character of this great little man who thought as much of a supposed sixth cousinship to Queen Victoria as of his discoveries about the circulation of the blood and inflammation.

Jones's paternal grandfather was a merchant and liveryman in London. His father, who was educated at Bridport, was first destined for the Army, but in 1782 obtained a position in the Custom House in Edinburgh. He married at the age of 38 in 1802 and, after a severe illness in 1804, retired on a pension and lived, for a few years in each, at St. Andrews, Stirling, South Queensferry, and Musselburgh, where he died in 1821. His second son, our Thomas Wharton, named after the Chairman of the Board of Excise, was born Nov. 28, 1808. He had two brothers and three sisters, all of whom I believe died unmarried.†

Of his childhood and youth no particulars are forthcoming except that he attended schools in the different towns to which his father migrated. His mother was a Scotswoman, Margaret Cockburn, of Ayton Mains, Co. Berwick. He lost his father when he was 13 years old, and then all his surroundings were Scotch. It is thus easy to understand that in later life no one would have taken him for an Englishman. In spite of what he says in one of the Whatman letters there is no doubt that his father's circumstances, after resigning his appointment, were decidedly straitened.

On leaving school Wharton Jones attended first the arts classes at the University of Edinburgh and then went through the medical course in the same city.

In due course, when he was about 19 years of age, he became assistant to Robert Knox, the celebrated extramural teacher of anatomy. This was in the days when the comparative unattractiveness of the third Munro left plenty of work for the private teachers, and especially for Knox, who was not only a striking personality but an orator and master of words and phrases. It was a tragic period in Jones's life. He did not like to speak of it and it left behind a permanent shadow.

---

\*The correspondence began in 1862 and became warmer and warmer till the climax in 1867. One thing that rankled was that Whatman claimed the picture as a family heirloom, another that he said his father had given Jones pecuniary assistance. Jones admitted that he had received two gifts of £50 forty years before, but pointed out that all the Philips money except £12,000 had gone to the Whatmans.

†His elder brother, Richard Eliston Jones, Lieut. H.E.I.C.S., died in 1828. The younger brother, Nathaniel Walton Jones, M.R.C.S., was a patient in University College Hospital when quite an old man, and we never heard of his being married. The three sisters died unmarried.



In 1826, when dissection was made compulsory for medical students, the difficulty of obtaining subjects became acute. Then there sprang up a "regular and legitimate though infamous craft of resurrectionists" (to quote from "The Times" of Jan. 1, 1829); and as you walk on the Calton Hill to-day, and look down upon the graveyard of the Canongate Church, you may still see the iron bars which were placed over the tombs to protect them from desecration. This lucrative business suggested to the villain Burke and his accomplice Hare the ghastly trade with which the name of Burke is always associated. Thirty or forty poor wretches were supposed to have been done to death by them and many of these were said to have been brought to Knox's rooms in Surgeons' Hall. His three assistants, Fergusson (afterwards Sir William), Jones, and Alexander Miller, had to make arrangements with Burke and Hare and pay over the money to them, and it was broadly hinted, after the trial, in "The Times," and in the Scottish papers, that Knox and his assistants knew too much. The "Caledonian Mercury" for example, said that an investigation should be held as to how the subjects were obtained "and in particular the students and assistants (during the last two sessions) of one gentleman, whose name has unfortunately been too much mixed up with the late proceedings, ought to undergo an examination as to the quarter whence bodies were procured, the state in which they were received and the manner in which they were dissected. . . . The present impression on the minds of the people is that one gentleman stands in the same relation to Burke that the murderers of Banquo did to Macbeth. This impression we believe and trust is ill-founded, but the fact of its existence, etc., etc." Unfounded it was, of course, but the publicity of the trial and the horror throughout the country created a distressing situation for all concerned, especially for Knox, although his students did give him a gold vase as a token of their confidence in him. Jones, who was always extraordinarily sensitive, felt the public odium acutely at the time. It also affected him in later life when he became a colleague of his two Edinburgh friends, Robert Edmund Grant and William Sharpey, at University College, London, and all three were Fellows of the Royal Society; for Sharpey had been intimate with Knox and, it is said, contemplated a partnership with him, but, when the scandal arose, he joined in the hue and cry against him, while Grant and Jones supported him. This led to a coolness which subsequent events did not tend to diminish.

Grant (1793-1874) came to Edinburgh in 1820; Sharpey (1802-1880) obtained the Edinburgh M.D. in 1823; and Jones, who was the youngest of the three, was teaching anatomy there at all events from 1827 to 1829. Grant was appointed Professor of Comparative Anatomy and Zoology at University College (then the University



of London) in 1827; Sharpey, Professor of Physiology in 1836, in succession to Jones Quain; and Jones was made the first Professor of Ophthalmic Medicine and Surgery in 1851. They were alike fortunate in having made extensive journeys on the continent, visiting the medical schools, as was the fashion of the time for those who were intending to devote their lives to the medical sciences, and when they were elected to the Royal Society—Grant in 1836, Sharpey in 1839 and Jones in 1840—there was another field in which to meet, the arena of pure science, not always free from the dust of conflict.

The Secretary of the Royal Society at this time was Peter Mark Roget (1779-1869), and he had held the appointment since 1815. His energy was unbounded, and so apparently were the fields of his enquiries. To the lay world he is best known as the author of Roget's "Thesaurus of English Words and Phrases." For us his most interesting work is the Bridgewater Treatise for 1834, on "Animal and Vegetable Physiology considered with reference to Natural Theology," because it was said that most of his facts were obtained by attending a course of Grant's lectures, which always rankled in Grant's mind, and in that of his friend Jones.

The endowment for the Bridgewater treatises was provided by the eccentric 8th Earl of that name.\* With a similar object the Actonian prize of the Royal Institution was founded by Mrs. Hannah Acton, of Euston Square. It was given septennially for the best essay illustrating the "Wisdom and Beneficence of the Almighty in the various departments of Science." Jones obtained the second award in 1851. He illustrated the subject by means of the sense of vision, in a simple little essay, explaining, in popular language, the anatomy and physiology of the eye of man and other animals, and assuming and constantly stating that the perfection of the eye is a proof of the Wisdom and Beneficence of God. It is interesting to note that at this time he did not know the true use of the ciliary muscle.

Roget was the first Fullerian Professor of Physiology† at the Royal Institution in 1833; Grant followed him in 1837; and, after the chair had been held by Rymer Jones, W. B. Carpenter and Gull, Wharton Jones was chosen in 1851. He evidently thought

---

\*Right Hon. and Rev. Francis Henry, 8th and last Earl of Bridgewater, who died in 1829. He was a learned man, but was more than eccentric. He was a bachelor; Prebendary of Durham; lived in Paris, surrounded by dogs and cats dressed like human beings. There were in all nine Bridgewater treatises, to illustrate "the Goodness of God as manifested in the Creation."

†Founded by John Fuller, of Devonshire Place (1756-1834), for promoting by means of lectures or otherwise the cultivation and improvement of that science and particularly that branch thereof called comparative anatomy. Many very distinguished men have held the chair.



a good deal of this professorship as he mentioned it on the title pages of many of the books he published afterwards.

Wharton Jones was a staunch defender of religious orthodoxy throughout his life, as became the winner of the Actonian prize. Grant, on the other hand, if he ever held such views, had abandoned them when he was our teacher in the seventies of the last century. He was then the friend of Darwin, with whom he worked, and we students used to listen with a sort of guilty pleasure to his satirical references to Providence and other matters then almost regarded as too sacred for enquiry. Grant died in 1874. If he had lived two years longer he would surely have smiled at the attitude taken up by Jones in a book of about seventy pages entitled "Evolution of the human race from apes, and apes from lower animals, a doctrine unsanctioned by science." It is an uncompromising attack upon the theory of evolution founded upon the following postulate without which his whole argument falls to the ground. "In the natural history of an organism we recognise something more than the manifestation of physical and vital forces—physical forces as the attribute of the machinery—and vital forces as the mainspring of its action. We recognise in the aggregate plan a Divine Idea, and in the fulfilment of the purpose an Almighty Hand. From the commencement of its development the body of an animal is in a continuous process of change, and yet it remains unchanged in plan. The transformations merely run in a circle, so that there is no progressive evolution; but the different races, so long as they exist, continue to retain each its own characters." After a caustic criticism of Haeckel and Darwin, he concludes with these words: "We thus see that EVOLUTION, from beginning to end, is an *unverified* and *unverifiable hypothesis*. The scheme may, indeed, be entertained, as it has long been, more or less, as suggesting inquiries into the natural affinities of organised beings; and in this respect I have just eulogised Haeckel's phylogenetic disquisitions. But when the doctrine is promulgated as a kind of *new revelation in science*, and obtruded on us almost as an *article of faith* in a propagandist and intolerant spirit, we are roused to repel the attempted encroachment. Our present advanced knowledge in Natural Science has not rendered the idea of Evolution a bit more probable than it was in former times. And it must be firmly denied that the conceit of Natural Selection by Survival of the Fittest has, in any degree, imparted to the theory more substantial body than it had before, or raised it to the scientific position which Darwin and his followers claim for it."

This passage is a good example of Jones's style and a clear reflection of a part—and not the least important part—of his mental outlook. It may be objected that it was written in advanced middle age, when the inward eye is apt to lose its power of



accommodation, and that it is unfair to generalize from such a late pronouncement. But his earlier writings show that it was no new thing for him to indulge in severe and sometimes impatient criticism of the work of others, and that nothing ever shocked him more than what he considered to be fallacious logic or careless observation. That is why it has been introduced here, so that the reader may appreciate this side of his character before we proceed to the discussion of the serious work of his life.

---

If it had not been for the Burke and Hare tragedy one guesses that Jones would not have left Edinburgh when he did. But no doubt he was glad enough to escape from it on the first favourable opportunity. Accordingly in 1829, or perhaps a little later, he went to Glasgow, where he was closely associated with Dr. William Mackenzie, the well known ophthalmic surgeon, and also with Dr. Harry Rainy, afterwards Professor of Forensic Medicine.

He helped Mackenzie with his widely-read text book,\* supplying, amongst other contributions, the frontispiece, which shows that he was already a very skilful draughtsman. All this confirmed, if it did not originate, his bent towards the practice of ophthalmic surgery. Here, like some other clever scientific men, he found time to devote to the drudgery of writing a manual of pharmacology.

After five or six years in Glasgow he moved to Cork, and stayed there from 1835 to 1837, engaged in medical practice, but devoting himself specially to the treatment of diseases of the eye and ear.

The year 1837 was his "Wanderjahr,"—rather late it may be thought, for he was now 27. He visited most of the important medical schools of the continent, and we hear of him addressing, in French, a meeting of naturalists and physicians at Prague, on the origin of the chorion.

In 1838 he came to London as Lecturer on Anatomy, Physiology and Comparative Anatomy at the Charing Cross Hospital, then quite a small medical school, but always having some well known men upon its staff. He held this post for fourteen busy years, to his own satisfaction and that of his colleagues and students. Amongst the latter was Huxley, who spoke in the highest terms of the method and quality of his physiological teaching. "I do not know," he said, "that I ever felt so much respect for a teacher before or since." His lectures were apparently very different from those delivered at University College later in life. This is Huxley's description of them: "Singularly dry and cold in form, they were admirable in logical construction, and full of knowledge derived

---

\* "Practical Treatise on Diseases of the Eye," by William Mackenzie, Lond., Longmans, 1830. Second Ed., 1835. Third (with section by Jones), 1840. Fourth 1854. French trans., 2 vols., Paris, 1856-7.



from personal observation and wide reading. The true *lumen siccum* of science glowed in every proposition which fell from the lips of the pale adust little man as he stood with downcast eyes and fingering his watch chain, at one corner of the table. He never had any notes, but the lectures would have read perfectly well if printed straight off. I used to wonder at and envy his 'facility,' not having learned in those days what price has to be paid for easy speaking of that quality."\* Another of his students, Sir Joseph Fayrer, of Indian fame, bore witness to his earnest, enthusiastic and impressive manner of imparting knowledge and to his good personal influence upon the students.

Jones came to London with a reputation already made. His writings were well known to the leading physiologists and comparative anatomists in this country and abroad, with many of whom he was personally acquainted. He had published a number of papers on human and comparative anatomy in the Proceedings of the Royal Society and in various Scottish, Irish, and other journals. Some of the earliest were on the eye, but perhaps the most important were those which described his investigations into the ova of women and mammiferous animals as they exist in the ovaries before and after impregnation. We must bear in mind that the ovarian ovum of man and the mammalia was first discovered by von Baer in 1827, not so very long before the time of which we are speaking.† Jones was one of the first‡ to discover the real germinal vesicle in the human and mammalian ovum, and to demonstrate the nature and significance of that body. This was in 1835.¶ He worked at this subject at least as late as 1843, when he published an elaborate criticism of the work of several foreign investigators in the form of a Report in the "British and Foreign Medical Review." §

In addition to these investigations on the ovum, his scientific work consisted chiefly of observations on the state of the blood and the changes that occur in the blood during inflammation and the healing process, and on the structure and development of the blood corpuscles. In these he made and described many new discoveries, amongst others that of the amoeboid movements of the white

\**Brit. Med. Journ.*, 1891, Vol. II, p. 1176.

†"Epistola de ovo Mammalium et Hominis genesi." Leipzig, 1827.

‡The other discoverers were Valentin in Germany and Coste in France.

¶"On the ova of women and mammiferous animals as they exist before and after impregnation; and the discovery in them of a vesicle analagous to that described by Prof. Purkinje in the mature egg of the bird." *Roy. Soc. Proc.* III, 1835, pp. 339-340.

§"Report on the ovum of man and the mammifera before and after fecundation." *Brit. and. For. Med. Rev.*, No. XXXII, 1843, *Forbes Med. Rev.*, XVI, 1843, pp. 513-557.



corpuscles,\* now such a familiar phenomenon that we scarcely pause to enquire about its discoverer.

In the meantime he was continuing his study of the eye and ear, and doing a certain amount—probably not much—ophthalmic and aural practice which resulted in at least one scientific paper—“Observations on Single Vision with Two Eyes”†—and two practical works. The first of these was an article on “Diseases of the Ear, and Hearing” in the “Cyclopedia of Practical Surgery,”‡ which was also printed as a separate book in 1841. Beyond the fact that the examination of the external ear was made by direct sunlight with or without a speculum and that his account of aural polypi was quite vague and wrong, the teaching was for the most part just what was given to students thirty years later. The other practical book was “A Manual of the Principles and Practice of Ophthalmic Medicine and Surgery.”§ It was one of a series of stumpy thick octavo manuals of unattractive appearance brought out by John Churchill, a series very familiar to many generations of students. The favourite text book on the eye at this time was Mackenzie’s,§ to which reference has already been made. Jones’s Manual proved to be acceptable; a second edition appeared in 1855 and a third in 1865. I have the first and third now before me. The first is remarkable as containing a long account of inflammation in general; he said he could not resist the opportunity which the subject offered of illustrating the general doctrines of pathology, especially those of inflammation. It is in this respect the work of a scientific pathologist rather than that of a practical surgeon. There are some beautiful hand-coloured steel engravings and a number of excellent wood cuts from his own drawings. It marks the border line between old and modern ophthalmology, for no mention is made of the ophthalmoscope. The third edition¶ has swollen from 570 to over 800 pages. There are more illustrations, including many coloured wood-cuts; the elaborate account of inflammation has disappeared; there is now a full description of the ophthalmoscope, at the end of which is this note, “Here I ought not to omit stating that in the spring of the year 1847, Mr. Babbage\*\* showed me the model

---

\*“The blood-corpuscle considered in its different phases of development in the animal series.” Mem. i. Vertebrata. Mem. ii. Invertebrata. Mem. iii. Comparison between the blood-corpuscle of the vertebrata and the invertebrata.” (1845). *Phil. Trans.* 1846, pp. 63-68, 89-102, 103-106. *Froriep. Notizen* xxxvi. 1846, col. 38-40; Silliman, *Journ.* i., 1846, pp. 128-129.

† *Roy. Soc. Proc.* iv., 1840, pp. 248-249.

‡ Ed. W. B. Costello. 4 vols. London. Taylor and Greening, 1861 (“Dis. of Ear and Hearing,” in vol. 2, pp. 1-55. “Ectropium,” in vol. 2, pp. 64-73.)

§ John Churchill, 1847.

§ See p. 103.

¶ John Churchill, 1865.

\*\*Charles Babbage, F.R.S., 1791-1871, famous for his “Table of Logarithms” and his Calculating Machine. See *Brit. and For. Med. Chi. Rev.* for Oct., 1854.



of an instrument which he had contrived for looking into the interior of the eye. The reflector was a small, plain glass mirror, with a part of the silvering rubbed off to look through." Elsewhere we read that "the ophthalmic surgeon to whom Babbage showed his instrument did not appreciate its value." If he had done so Jones would have anticipated Helmholtz's discovery of the ophthalmoscope (in 1851) by four years.

In order to identify himself completely with London, Jones took the membership of the Royal College of Surgeons in 1841; and when the new class of Members who were to be called Fellows was instituted by the Charter of 1843, he was included amongst those who were elected in 1844, chiefly from members of the staffs of London and provincial hospitals and from the fighting services.

In 1851 it was decided to institute a Professorship of Ophthalmic Medicine and Surgery at University College, then, as always, in the forefront of educational advance, and with already a twenty-five years' record of restless energy and success. The chair was given to Jones, and he was also made Ophthalmic Surgeon to the hospital, a post which involved chiefly out-patient practice, but included the charge of a few beds. He held both these appointments for thirty years. At the time he entered upon them he was doing scientific work of a higher quality than at any other period of his life. He must have found University College congenial for these investigations. There he was surrounded by the devotees of pure science, and the spirit of scientific enquiry prevailed amongst the members of the hospital staff.

In 1850, the year before his appointment, he had published, in the "Guy's Hospital Reports," his Astley Cooper Prize essay "On the State of the Blood and Bloodvessels in Inflammation, as ascertained by Experiments, Injections, and Observations under the Microscope." It occupies 100 pages, and is based on many original observations. His own conclusions and those of other physiologists are freely discussed. There are nine beautiful coloured plates and many woodcuts.

After further investigations this was supplemented, in 1852, by a paper in the Transactions of the Royal Medical and Chirurgical Society,\* describing the phenomena of inflammation as it occurs in the bat's wing, his previous observations having been confined to the web of the frog's foot. This was the work that largely occupied his attention during the early days of his professorship. During its progress he wrote another paper on "Blood-corpuscle-holding Cells."†

At University College, although perfect peace did not by any

---

\**Med. Chir. Soc. Trans.*, XXXVI., 1853, pp. 391-402.

†(Review) *Brit. For. Med. Chi. Rev.*, XI., 1853, pp. 32-38.



means always prevail amongst the professors, Jones's originality and accuracy were appreciated by most of his colleagues. Sir William Jenner is said to have spoken of him as "one of the greatest Englishmen who ever lived"—surely rather exaggerated praise. His influence upon students of an enquiring mind was generally acknowledged. Lister, who for a time was his clinical assistant, admitted the inspiration. When he went abroad he took introductions from Jones to foreign professors, and when he was himself engaged in the study of inflammation, his method of investigation was clearly modelled upon that of his teacher. Lister always spoke and wrote of Jones with respect, even when he differed from his conclusions. It is therefore sad to read, in one of Jones's latest writings,\* a string of bitter remarks about his pupil, accusing him of misrepresentation, inaccuracy of observation and scientific incompetence. I quote one sentence which hints at the old friendship, while it expresses the bitterness of an old man—he was then 83—who thought that his scientific brothers had misunderstood or overlooked his work and had bestowed the palm upon the unworthy. But it must be remembered that in the same book he is equally severe upon Cohnheim, Schiff, Michael Foster, Burdon Sanderson, McKendrick, Virchow, Savory and Horsley. The fact is that when Jones had reached a certain point in his career he stopped and seemed unable to put up with the discoveries of his successors. Here are his actual words: "This and such-like blundering strictures which Sir Joseph Lister (under the misleading auspices of his Professor of Physiology, the late Dr. Sharpey, who was at the same time Physiological Secretary of the Royal Society) has levelled against my Essay, 'On the State of the Blood and the Blood-Vessels in Inflammation,' betrays a neglect of research by observation of phenomena in their sequence and correlations and an illogical proclivity to hasty excogitation. Lister had been a pupil of my class in University College, and had served temporarily as my ophthalmic assistant at the hospital, having, at his own request, obtained permission from me to do so. That Sir Joseph had been studying my Papers on Inflammation with great diligence was evident from the pertinence of his inquiries in conversation with me respecting my observations, in order to obtain by word of mouth further elucidations of the subject. So intent, indeed, was he in his inquiries that he, one day, accompanied me in my walk to the Regent's Park after the hospital visit, *cross-examining* me all the way!"† Which seems a natural and proper thing to do. It conjures up a pleasant picture of the eager young surgeon from

---

\*"Report on the state of the blood and bloodvessels in inflammation and on other points relating to the circulation in the extreme vessels, etc." Baillière, Tindall and Cox, 20 and 21, King William Street, Strand, 1891.

† *Loc. cit.* p. 39.



Edinburgh and the equally earnest professor pacing the walks of Regent's Park and picking one another's brains about these knotty problems.

Only two short letters—or rather notes—from Jones to Lister have been preserved. The following is interesting from its quaint formality, and as showing that their friendship had not cooled in 1855; but this was two years before the reading of Lister's paper which gave so much offence. It begins "My dear Sir." Lister was hardly out of his pupilage:—

"35, GEORGE ST., HANOVER SQ.,  
May 17th, 1855.

MY DEAR SIR,

I am labouring under an attack of influenza and am compelled, therefore, with great reluctance to forgo the pleasure which I should have had in dining with you and your father.

With my best respects to your father,

I remain, My dear Sir,

Yours very truly,

T. WHARTON JONES.'

In trying to estimate the importance of Jones's work on the blood, the circulation and inflammation, we must not forget that there were many toilers in this field, and that it was no novelty to examine the circulation in the web of the frog's foot; this was the method adopted by Kaltenbrunner, of Munich, who died in 1826, and possibly by some of his predecessors. Amongst the contemporaries of Jones were J. Thomson, Wilson Philip and his friend Charles Hastings, James Paget, Lister and others. Each contributed his quota, one larger, one smaller. Jones's was one of the largest. Lister's was unique because he confined his attention to the very earliest stages of inflammation, a period which had been neglected by all previous observers. There was a good deal of criticism amongst some of these pioneers, and far too many disputes about priority—a sad waste of energy and time; especially when one bears in mind that they knew nothing of the influence of micro-organisms on inflammation, or the varieties and functions of leucocytes, or the value of the clinical thermometer. Hence most of their writings have only an academic interest for us. What, for example, can we make of such statements as the following, taken from near the end of the Astley Cooper Prize essay: "That the increase in the quantity of fibrin is directly owing to the inflammation, appears from the fact pointed out by Andral and Gavarret, that when inflammation supervenes in the course of typhoid fever, the fibrin, from being less in quantity than natural, becomes greater."

Whilst he was working at the circulation and inflammation, Jones made two interesting discoveries in comparative physiology.

The first of these was that the veins of the bat's wing are furnished with valves and are endowed with rhythmical contractility, and that the onward flow of the blood is accelerated by each



contraction.\* These phenomena were observed in the course of a methodical preliminary study of the distribution, structure and endowments of the arteries, veins and capillaries. The contractions occur on an average ten times a minute and are to be distinguished from the tonic contractions of the arteries, which tonic contractions did not, as Paget had said was the case, occur in the veins.

The second discovery was that of the function of the caudal heart of the eel. The paper in which it was described dealt also with the structure of the muscular coat of the veins of the bat's wing. Like most of his papers it is beautifully illustrated from one of his own drawings. This caudal heart was discovered by Marshall Hall (unless Milne Edwards was right in saying that it was known to Leeuwenhoek (1632-1723). Marshall Hall thought that it was a blood-propelling heart. Jones proved that it was a lymphatic heart, though he could not make out how the lymph entered it. He cleverly explained the appearance of blood being propelled in successive drops along the caudal vein by showing how the drops of transparent lymph which were shot into the blood stream by the contractions of the caudal heart gave rise to the deception.

---

Now that we have traced Jones's career to the time when he was a recognized authority on ophthalmology in London, it is appropriate to pass in review what he did for the advance of that science. A fair general idea of this may be obtained from a summary of his published writings on matters connected with the eye; but it is confessedly imperfect, because his letters and short communications to journals were so many and so scattered that it would be almost impossible to make a complete list of them. They are placed in chronological order.

Between the time of leaving Edinburgh and coming to London there were at least five scientific papers.

"Description of the eye of the Cuttlefish," 1831.

"Notice relative to the *pigmentum nigrum* of the eye," 1833.

"On the motions of the pupil," 1834.

"On the retina and pigment of the eye of the common Calamary," 1836.

"On the so-called choroid gland or choroid muscle of the Fish's eye," 1838.

---

\**Phil. Trans.*, received November 20, 1851, read February 5, 1852, with two appendices, received December 11, 1851, read February 5, 1852, and received May 10, 1852, read May 13, 1852.

†"Microscopical characters of the rhythmically contractile muscular coat of the veins of the Bat's wing, of the lymphatic hearts of the frog, and of the caudal heart of the eel." *Roy. Soc.*, received November 26, 1867, read January 8, 1868. *Phil. Trans.*, CLVIII, 1868, pp. 675-683. *Roy. Soc. Proc.*, XVI, 1868, pp. 230-231.



Whilst he was teaching anatomy, physiology, and comparative anatomy at Charing Cross Hospital there appeared:

"Observations on single vision with two eyes," 1840.

"A manual of Ophthalmic Medicine and Surgery," 1847.

During his professorship at University College the manual passed through one French and two English editions, and he also published:

"The Actonian Prize Essay," 1851.

"A Report on the Ophthalmoscope," 1854.

"Defects of Sight," 1856.

"A Catechism of the Medicine and Surgery of the Eye and Ear," 1857.

"Analysis of my sight with a view to ascertain the focal power of my eyes for horizontal and for vertical rays and to determine whether they possess a power of adjustment for different distances," 1859.

"On the invention of stereoscopic glasses for single pictures with observations on the stereoscope and stereoscopic vision," 1860.

"Failure of sight from railway and other injuries of the spine and head," 1869.

We need not dwell long upon the purely anatomical and physiological papers of his early manhood. They were good examples of the thoroughness and accuracy that characterized all his original scientific writings. The short paper on the so-called choroid muscle was only a confirmation of observations made by Albers in 1806. With regard to the motions of the pupil it may be noted incidentally that, though he did not, any more than his predecessors, Kölliker, Schiff and others, succeed in making out the precise musculature of the iris, he did observe, figure and describe to his class plain muscular fibre about 1843, that is, five years before Kölliker announced his discovery of this tissue. Jones obtained his specimens from the walls of the intestines, stomach, oesophagus, uterus and other organs. This, as well as other original observations of Jones on involuntary muscular fibre are recorded by Lister in his paper on the contractile tissue of the iris.\* It is worth noting that Lister, writing in 1853, owned that, though it was easy to prove the existence of the *sphincter pupillae*, he had never been able to demonstrate the *dilatator* to his satisfaction.

We have already dealt with the manual (p. 13), which was his chief contribution to ophthalmology whilst he was at Charing Cross Hospital. The paper on single vision with two eyes† was very short and of no great importance; he returned to this subject again when writing on the stereoscope.

---

\* Lister's Collected Papers, vol. I. p. 1 (foot note), p. 3, p. 8. *Quart. Journ. Micr. Sci.*, vol. I (1853), p. 8.

† *Roy. Soc. Proc.* IV, 1840, pp. 198-199.



His first publication after coming to University College was the simple popular Actonian prize essay (p. 9).

This was followed in 1854 by a "Report on the Ophthalmoscope,"\* three years after its invention had been announced by v. Helmholtz. There was first a summary of the observations that led up to the discovery, a brief description of the instrument and a very few clinical notes. Neither here nor in Germany was it claimed that therapeutics had so far gained anything from the ophthalmoscope, but its value in diagnosis was strongly insisted on.

Jones was fond of writing reports: not always reports to any particular body, but reports to the world in general. This on the ophthalmoscope appeared in a review. The reader will recall another on the mammalian ovum (p. 12) and there were two others on inflammation.

He also had a proclivity for writing thin, small octavo, semi-popular books, uniform in size with the Actonian prize essay.

One of these "On defects of sight, their nature, causes, prevention and general management,"† appeared in 1856. It is difficult to imagine for whom it was intended. In the preface he says that, being impressed with the fact that much of the defective sight and blindness we meet with is the result of disease, either preventable altogether or, at least curable if taken in time, it had occurred to him that a small volume containing some guiding principles relative to the cure and preservation of the sight would be useful. "Accordingly," he continues, "I have thrown together, in the following pages, such observations on the subject as appear to me calculated to answer the end in view." Rather more than twenty pages at the beginning are devoted to warnings against common dangers to the eyes and about the same amount at the end of the volume; but the bulk of it is an epitome of the manual. It seems too deep for the general reader, but too superficial for the practitioner or even the student.

The same criticism applies to a companion volume which was published the following year "A Catechism of the Medicine and Surgery of the Eye and Ear"‡; but this was avowedly meant "for the clinical use of Hospital Students." "Question and answer," he says, "being calculated to bring forcibly and briefly to mind at the moment the salient points of a subject, I have drawn up this Catechism in the hope of aiding the student in his clinical observations at the hospital;" and he adds "for more systematic

\* *Brit. For. Med. Chi. Rev.*, XIV, 1854, pp. 549-557.

† John Churchill.

John Churchill, 1857.



study in the closet, during leisure half-hours, I would recommend my 'Principles and Practice of Ophthalmic Medicine and Surgery.' "

One example will be enough to show what the catechism is like.

"What is the best local treatment for granular conjunctiva ?

Scarification of the affected conjunctiva every second or third day, and immediately thereafter the application to it of some strong salve, such as the red precipitate (3j.—3j.).

Is not blue stone much used as an application in granular conjunctiva ?

Yes, and abused also ; the result too often being the destruction of the palpebral conjunctiva, as well as the granulations."

We do not know whether this was a successful venture, nor whether it was his own initiative or the persuasions of his publisher which made him write another catechism the following year on a much more ambitious subject, "A Catechism of the Physiology and Philosophy of Body, Sense, and Mind, for use in Schools and Colleges and in Private Study."\* Its object was to encourage the teaching of the rudiments of the physiology of the body, in conjunction with the philosophy of the mind, in the curriculum of general education. Not only from the hygienic point of view and because prevention of disease is better than cure ; but chiefly because such a study affords a good mental training and "prepares us to observe correctly, and to appreciate at their just value, facts concerning ourselves and the relations in which we stand to the world around us."

It was rather a tough morsel for boys and girls at school, as may be judged from this extract from the introduction :

"Sum up what you have been saying of the death and reproduction of plants and animals.

Though plants and animals enjoy only a temporary existence as individuals, their existence as races is of indefinite duration ; their temporary existence, as individuals, being maintained by nutrition—their indefinitely prolonged existence, as races, secured by reproduction. In short, though the individual dies, the race continues to live.

You are here speaking in reference to the present geological epoch, are you not ?

Yes ; for the extinction of races and the creation of new have been shown by geologists to have repeatedly taken place in former phases of the earth's development.

Extinction of races and creation of new ! But is there not reason to believe, etc., etc." And then follows the proper orthodox view of the day about Darwin and his theories, which, as we know, he held with great tenacity and even impatience.

Of more value than these catechisms was a short paper which appeared in the Proceedings of the Royal Society in 1860 with the title : "Analysis of my sight with a view to ascertain the focal power of my eyes for horizontal and for vertical rays and to

---

\*John Churchill, 1858.



determine whether they possess a power of adjustment for different distances.\* He himself was myopic, and what he calls "distigmatic not monostigmatic." In this paper he deals with the symptoms, not the pathology of astigmatism.

He evidently thought that he had no "adjusting power in his eye," and he doubted about Müller's experiment with two pins; but he owned that, if anyone can corroborate it he must have adjusting power in his eye. "I have never succeeded," he says, "in seeing the phenomenon myself." He appeals to others to carry out similar experiments on themselves and to report the results of their observations to him.

Jones described astigmatism under the heading "Cylindrical Eye" in the first edition of his *Manual* (1847), and in "Defects of Sight" (1856). In the third edition of the *Manual* (1865) he calls it "Distigmatism." Here he tells of the well-known observations of Dr. Thomas Young in 1801, and of Mr. Airy, the Astronomer Royal, in 1827. His own contribution to the subject appears to have been to show that the shape of the cornea really was accountable for the defect of vision, as Airy had suggested it might be, and to prove that a moderate degree of astigmatism is "if not the rule of sight, at least of very common occurrence."

In the same year, 1860, he published a short paper or booklet "on the invention of stereoscopic glasses for single pictures with preliminary observations on the stereoscope and on the physiology of stereoscopic vision."† Five chapters are devoted to a description of the stereoscope and the physiology of vision, especially that of single vision with two eyes and stereoscopic vision, and to a discussion of the relief or intaglio of objects as observable in Nature with the two eyes as compared with that in which their reproductions are commonly made to appear in the stereoscope. In the last short chapter comes the pith of the paper: a description of some concave cylindrical glasses, cunningly devised in order to give the observer the stereoscopic effect when looking with both eyes at a picture. The first experimental lenses he ground himself out of amber; the finished article was the work of a lapidary. The result was more interesting than practical. No one but a scientific enthusiast would arm himself with such a pair of spectacles before visiting a picture gallery, or use them when he arrived. In describing their effect, Jones owned that he was chiefly relying on his own experiences. He added, however, that most persons who tried them agreed with him. But there were evidently many exceptions. "One gentleman exclaimed, 'But should there not be two pictures?' Other persons, unable at first to realize the effect, have, after a little observation, perceived it, and declared that the

---

\**Roy. Soc. Proc.*, X, 1859-60, pp. 380-385.

†John Churchill.



‘picture looked more natural.’ Other persons again, however, taking their idea of stereoscopic effect literally from the exaggerated appearances in the stereoscope, have declared that they could perceive no such effect at all.”

Nine years passed after the publication of this paper without any contribution being made by Jones to ophthalmology. He was occupied, as we have seen (p. 109), with caudal hearts and physiological obscurities. In the meantime great and increasing attention was being directed to the remote effects of railway injuries, and a wide field was thus opened for speculation by doctors and for wrangling in the courts of law. The general public, the insurance companies, the railways, and the lawyers were chiefly interested in the claims for compensation and the notoriously frequent cases of malingering. The doctors, while equally keen about the detection of fraud, were honestly trying to discover how a shake-up in a railway accident caused—if it did cause—the bizarre combination of symptoms complained of by some of the victims. They were handicapped in three ways; first, they had a very imperfect knowledge of the nature of “hysteria” and the protean forms it can assume; secondly, their acquaintance with the physiology and pathology of the nervous system was inadequate; and, thirdly, they had not shaken off the love of speculation that they had acquired by inheritance, and could not help guessing at the answers to questions of which it would have been far better to acknowledge their ignorance. The great advances in our knowledge which have been made in the last fifty years should make us lenient critics, especially when we reflect that, even to-day, the most experienced observers are sometimes baffled by imposture, though the part of the malingerer is much less easy to play and less profitable than it used to be.

Foremost amongst the authorities on railway accidents, and consequently a frequent witness at trials was the senior surgeon to University College Hospital, Mr. (afterwards Sir John) Erichsen, and it was natural that he should appeal to his colleague Jones to explain, if he could, the anomalous signs and symptoms complained of by those who had been involved in railway accidents. Erichsen was the inventor of the unfortunate phrase “Railway Spine,” which, being readily caught up by the public, produced, by suggestion, innumerable temporary backaches, and must have cost the insurance companies thousands of pounds. He also wrote a little book in 1866 on railway and other injuries of the nervous system and, I cannot doubt, inspired the next book by Jones which we have to consider. “Failure of sight from railway and other injuries of the spine and head, its nature and treatment with a physiological and pathological disquisition into the influence of the vasomotor nerves on the circulation of the blood in the extreme vessels.”\*

---

\* James Walton, London, 1869.



The title and still more the preface prepare the reader, after what he has already heard of our author's peculiarities, to find that the greater part of the book is occupied with disquisitions on general pathology and physiology. Jones could not resist the opportunity offered by having to write a book on a subject of the day without going over the old ground and restating his views about the circulation in the extreme vessels, inflammation, thrombosis and embolism; and, indeed, chapters ix to xiii give in the space of about ninety pages a useful and detailed compendium of all his work on these subjects. For this he offers the following excuse. "The points treated of in the five preceding chapters have so significant a bearing on our subject, that I have not considered it too much to dwell on their elucidation at the length I have done, the more especially as in the case of certain of them, great misconception, it has been shown, prevails. It is surprising, indeed, to see that while the mechanism of the circulation through the heart and great vessels is so well known, the mechanism of the circulation in the extreme vessels is really imperfectly understood, notwithstanding that the subject is one of fundamental importance in pathology as well as in physiology. In the pathology of inflammation, especially, we have seen what an important link in the chain of processes the state of the blood and blood vessels forms."

At the end of the book he returns to the subject in an appendix "comprising an additional chapter on inflammation," the object of which is summed up in the concluding paragraph: "While thus repudiating Professor Virchow's view of inflammation [proliferation of leucocytes], so remarkable for its extremeness in one direction, Dr. Cohnheim, it appears to me, promulgates a view of the subject [transmigration of the white corpuscles], as remarkable for its extremeness in the opposite direction."

This does not, however, exhaust the list of purely scientific matters treated of in the book. Much of the remainder is devoted to such questions as disturbances of the circulation in the optic apparatus, the movements of the pupils and the action of drugs, so that there is comparatively little space left for the special discussion of railway and other injuries. And, when the subject is reached, it must be owned that the way in which it is treated is disappointing. Less than two dozen cases altogether are reported, and these in an imperfect way both in respect of the histories supplied by the patients, and the physical examination by the doctors. The experience of the late war makes the comparison between "shell-shock" and "railway-spine" inevitable; and one closes the book with the feeling that neurasthenics and hysterical folk must have excited in Wharton Jones and Erichsen more interest and sympathy than was good for them, or fair to those from whom they were seeking compensation.



This treatise has been dealt with at some length because it is the last of any importance that Jones wrote upon the eye. And also because it shows that, at the age of 61, he had already, at least as far as ophthalmology is concerned, ceased to advance, unless it were, to use his favourite word, in the way of excogitation. And yet he would have thought it impertinent and unjust to speak of him as an excogitator, for his motto for the preface is this Baconian instruction, "Nil fingendum, nil excogitandum, sed inveniendum quod Natura ferat, quod Natura faciat."

And, in his younger days at least, this was the principle on which he worked. It was indeed his guiding principle in later life, although he may at times unconsciously have departed from it. It was the principle which made his teaching an inspiration to the student who was bent on acquiring knowledge, but tedious and unintelligible to those who were only gaping to be crammed. "His method," to quote Sir John Tweedy, "was that of observation, experimentation and verification. When questioned by pupils, he did not return a mere didactic answer: his maxim was 'let us look and see.' "\*"

Sir John Tweedy knew him better than any of his colleagues or pupils; we may, therefore, before leaving the subject of Jones's contributions to ophthalmology, again quote from the obituary notice which he contributed to the "Lancet." Speaking of Jones as an operator, Sir John Tweedy says that he was "not showy or dexterous in the narrow sense of the term, but he was successful as judged by results." He goes on to say that amongst other additions which he made to our knowledge was his explanation of astigmatism and adds that he was one of the first (if not the first) to observe the frequent association of retinitis pigmentosa with deaf-mutism and other neurotic disorders; and he continues—"In the course of his investigations and experiments with calabar bean he noticed the beneficial action of the local application of this drug in some cases of acute glaucoma before the special therapeutic properties of this drug in glaucoma had been observed, so far as the writer of this notice is aware, by any other person. His explanation of the *modus operandi* of calabar bean in this disease was faulty, but the observation was well-founded and correct."

The last ten years of Wharton Jones's life in London did not produce any further contribution to science, unless we consider the two lectures on evolution delivered at University College, in October, 1874, and October, 1875, as real contributions to science. They were published in 1876 and were referred to when we were trying to form a preliminary estimate of his character and mental outlook. Here we need only remind ourselves of the line of his

---

\* *Lancet*, 1891, vol. 2, p. 1256, November 28.



argument and of his unswerving orthodoxy by the following quotations: "The question of the *Origin of Man*, it must be concluded, is one entirely beyond the pale of Natural Science. But when, where, and howsoever his first advent on the earth took place, this much is certain, that there are no valid grounds in support of the thesis that he ever existed under any other presentment or embodiment than that of *Man*."

His opinion of Darwin and his followers is shown in the last paragraph of the first lecture. He has been comparing evolutionists to the Schoolmen of the dark ages, who "lost themselves in trying to make of the Philosophy of Aristotle what it was not;" and he goes on: "The result in this case being as unprofitable as the Quiddities of the Schoolmen, we may, perhaps not unjustly, apply to the followers of Darwin the Poet's censure of the 'Sons of Aristotle:'

" They stand  
Locked up together hand in hand.  
Everyone leads as he is led:  
The same bare path they tread,  
And dance like fairies a fantastic round,  
But neither change their motion, nor their ground."

Darwin, Wallace, and Haeckel shocked many good people, or, at all events, disturbed their peace of mind, to an extent which it is now difficult for us to appreciate. To them, therefore, counter-blasts from men of science, like that of Jones, were welcome and soothing; but for his fellow workers it was sad to see one who had been so active a pioneer taking up such a stationary and uncompromising attitude, and showing in other ways that he was out of sympathy with the irresistible progress of science. This critical and irritable spirit was not the only cause of his silence. His mind seemed to have lost its elasticity, and besides, although he pursued his scientific studies to the last, he was becoming more and more occupied with family genealogies and his grievance against James Whatman for retaining the family heirlooms. This led to other historical investigations, the nature of which may be gathered from the final paragraph of the preface to the lectures on Evolution:

"Historical and ordinary anatomico-physiological researches have much in common in respect to method—the object of both being to ascertain facts and to trace out their concatenations and correlations. In lately editing for the Camden Society the Life and Times of my ancestral kinsman, brave old Bishop Bedell, of Kilmore—'Saint, Sage, and Hero' as he has been happily characterized by Mr. Gladstone, I followed, in a small way, the example of Niebuhr and Mommsen, inasmuch as I searched or had searches made in all directions, for original documents—wills, state papers, letters, and the seals thereto attached, parish registers, diocesan registers, tombstones, etc. In doing so, the aim was to



obtain *authentic* information from *genuine* contemporary documents, in regard to the true reading of which there could be no doubt, and thereby to correct various current misconceptions. This, it is obvious, was merely the prompting of common sense and duty—although I believe that habits of scientific method in physiological and pathological researches may have materially aided the exercise [of] discrimination in my genealogical and historical inquiries.”

The reader will not fail to notice the reason for dragging Irish history into an attack on Darwinism. It was to contrast his own way of going to work with that which he thought was adopted by many, if not most, scientific explorers.

The outcome of these historical researches was a learned volume on ‘The Life and Death (during the Rebellion of 1641) of his ancestral cousin, Bishop Bedell, of Kilmore.’ It was issued by the Camden Society in 1872. The curious will find the full and characteristic title below in a foot note.\* A cousinship was claimed because the bishop’s mother, Elizabeth Elliston, who died in 1641, was a far back ancestor of Jones’s maternal grandmother. About a third of the book is a carefully edited reproduction of an extremely interesting old manuscript in the Bodleian, written probably by the eldest son of the bishop. This is followed by twenty chapters evidently representing a vast amount of genealogical research, to which are added three appendices which include two belated letters and a pedigree. This book is not merely an account of William Bedell and the direct and collateral branches of his family; it also includes a pretty wide survey of contemporary Irish history, well told and thoroughly readable. It is a period with which most of us are probably but slightly acquainted, but it has a special interest in the present distracted state of that country. We may, perhaps, glean from it this crumb of hope: that, as murder and other atrocities seem to be the normal expression of Irish discontent, they are likely to subside as they have so often done in the past. But as far as permanent peace is concerned such glances as this into the past are, it must be owned, by no means encouraging.

From this he passed to a more extensive study of Irish history and politics, which resulted in a small volume on “Rule in Ireland, from St. Patrick to Cromwell,” published many years afterwards. In the advertisement it is stated: “The following pages are extracted from a work in manuscript entitled—‘Story of the Irish Rebellion of 1641, and its correlations with the contemporary

---

\* A true Relation of the Life and Death of the Right Reverend Father in God, William Bedell, Lord Bishop of Kilmore in Ireland. Edited from a MS. in the Bodleian Library, Oxford, and amplified with genealogical and historical chapters, compiled from original sources, by the representative of the Bishop’s mother’s family of Elliston, Thomas Wharton Jones, F.R.S. Printed for the Camden Society, MDCCCLXXII.



Troubles in England and Scotland,' on which the author has been for some years engaged. Ventnor, I.W.'''\*

It is a very concentrated piece of history; too full of facts related in quick succession to be interesting. There are a few, but not many, of Jones's own comments, from which it may be gathered that his sympathies were not all with Ireland as opposed to England. Thus he points out that Roman Catholicism was imposed upon Ireland by Henry II., but was not the original form of Christianity adopted by that country. This is, of course, no excuse for the harsh treatment of Irish Roman Catholics, but it partly takes the sting out of one of the most cherished of Irish grievances. He also shows that some other Irish grievances are founded on complete misconceptions, and we learn without surprise that he himself was a staunch Unionist.

---

Unfortunately, historical studies, sometimes made vicariously, brought no grist to the mill. On the contrary, they ate into what little grist may have been on the way. Jones never had a large private practice, and, as I knew him, his antiquated manner and appearance were by no means calculated to attract patients or to inspire their confidence. What little there may have been therefore dwindled completely away, and as none of his books, except perhaps the "Manual," can ever have been a source of much income, his circumstances became more and more straitened, and by degrees he fell into absolute poverty. His circle of intimate acquaintances had never been large, and his somewhat caustic pen and habit of very free criticism had brought some of his earlier friendships to an untimely end. Few therefore knew of his miserable plight when the exceptionally severe winter of 1880-1881 set in. It was bitterly cold. There was a succession of blizzards and the snow lay deep in the streets, or was piled up into walls six feet high or carted into huge heaps in the squares, the traffic for seven days being almost at a standstill; when, one day Mr. Tweedy (as he then was) was asked at a meeting of the staff of the "Lancet" whether the biography of Wharton Jones was ready, as it was reported that he had written to University College to say that he was prevented from attending, presumably from illness, and it was thought that at his age—he was then 73—an obituary notice might soon be required. Tweedy accordingly went to the little house in George Street where, as has been said, Jones had given rooms to a poor couple—husband and wife—who looked after him in return for their lodging. "To his horror he found his old teacher crouched over a fireless grate,

---

† R. Medley, 38, High St., Ventnor, 1887, price 6d.



his shoulders hunched up under a mass of shawls and shabby wraps, the picture of destitution. He was gnawing an old and uninviting piece of beef steak and a crust of bread, the wretched meal being all, as the woman of the house declared, that she and her husband could spare from their own scanty food-supply.”\* He was, in fact, not only very ill but penniless and starving. Tweedy forthwith enlisted the sympathy of his colleagues Dr. Sidney Ringer and Mr. Erichsen and other leading medical and scientific men, and in a few hours had collected a sum of £140, which was paid into the bank in sovereigns so that Jones might not know to whom he was indebted for the money which literally saved his life, though his most pressing needs had been already quickly supplied by the kind care of Mrs. Ringer, who had had much experience as a nurse.

About this time his piteous case was presented by Huxley and Sir Joseph Fayrer to Mr. Gladstone. The civil list of pensions was then made up, but the promise was given that Jones's name should head the next list, and he received from this source £150 a year from October 31, 1881, to November 7, 1891. He also obtained the Tancred Pension of £80 a year in June, 1881, at the instance of Sir William Jenner who was then President of the Royal College of Physicians, which he enjoyed till the time of his death.

Assured of this moderate but perhaps adequate income, and recognizing that he was no longer fit for his work at the College and Hospital, Jones sent in his resignation and was granted the title of Emeritus Professor. He gave up his house in London and settled down at Ventnor in the Isle of Wight, where, after life's rather stormy voyage, he spent the evening of his days in a quiet haven. It was ten years before the obituary notice was needed.

Here he lived very quietly and evidently most economically, for he left a substantial sum (about £800) at his death.

Dr. Robert Robertson, of Ventnor, who was Resident Medical Officer at the Consumption Hospital in 1881, and who attended him on the rare occasions when he needed medical advice, draws a pleasant picture of the sage in his retirement, his few old cronies and his simple life, which may be quoted almost in full.

“No. 2, Swiss Cottages, where Wharton Jones lived while in Ventnor, and where he died, is one of a pair of small cottages of three stories in Belgrave Road facing south and looking out on the English Channel. As in many houses in the town, the cottages have their lower story below the level of the road. And here the tenant of the two cottages lived, working the two cottages as one house, and letting off the two upper stories as lodgings. Mr. Jones occupied the tiny south sitting room and small south bedroom of

---

\*From notes supplied by Mr. Victor Plarr, Librarian of the Royal College of Surgeons.



the westernmost cottage. From its sunny and sheltered situation, and from its convenience of access to the main road of the town and of the undercliff, it was very suitable for an old man who found walking difficult.

On any bright morning in the 'eighties' a little old man with round shoulders, wearing a hard felt hat well off his forehead, with long grey hair down over the collar of a rather heavy overcoat which reached nearly to his heels, might have been seen walking slowly in the sunshine, with the help of a stick, along the footpath in Belgrave Road.

Eyes sunk under a large forehead, a Hibernian mouth and heavy chin, and the complexion of a chronic invalid, made one look at him a second time if one passed him on the road.

If you visited him in his lodgings in the winter, you would find him buried in an easy chair beside the fire with the temperature of the room about 70° Fahr., his head covered with an old peaked cloth cap, an overcoat on, his knees protected by at least two old rugs, and his feet in Wellington boots.

'You are looking at my boots,' he said to me on one occasion, 'I did order a new pair twelve years ago, but I remembered that my brother had an attack of apoplexy the day he put on a new pair of boots, so I countermanded the order.'

It has been said that he was so afraid of taking cold that he would allow the sheets on his bed to be changed only twice a year. Judging of what I saw of his bedroom, I should say that that was probably untrue.

He lived very simply: 'Four ounces of lean beef steak daily, half at midday meal and half in the evening, with an ounce of chocolate after each meal, that is what I eat.'

He was not unsociable. While he was able to walk so far he used to visit his friend the Rev. Clement Hue at 'the Cottage,' St. Lawrence, about one and a half miles (Mr. Hue was, I believe, the son of a former physician at St. George's Hospital), and it was there I first met him at a garden party in the summer.

On one of Wharton Jones's visits to 'the Cottage' he noticed that an old tortoise in the garden was going blind, and at his request the tortoise was taken daily to 'Swiss Cottage' to be under Jones's care until it was cured. ['Mr. Jones carefully dropping drops into the eye of the creature in spite of vigorous and sometimes successful attempts to bite him.']

He visited also at 'Aherlow,' the residence of Dr. and Mrs. Shaw, less than half a mile away. Dr. Shaw, an assistant surgeon at the battle of Miani, Scinde, had then gone into the Mint at Madras before leaving India. [The chaplain of the Consumption Hospital, the Rev. J. A. Alloway, says he well remembers the three old men spoken of as Abraham, Isaac and Jacob—Wharton Jones, Hue, and Shaw—



walking up and down in front of his house with arms linked, talking as they went.]

He had visits, too, from his old friend Mr. Commissioner Kerr, his residuary legatee, whose daughter lived in Ventnor and still lives here.

It is possible that he had other friends unknown to me. Acquaintance with those mentioned, indeed, implies that he might have known anyone that he cared to know. But he was easily fatigued, and could hardly face the effort of much social intercourse.

On one occasion I asked an old gentleman, who was senior secretary of the Archaeological Society of Oxford, to call on him, but as he was deaf they failed to interest each other.

To Mrs. Shaw, one of the kindest of women, he owed much. Up to the last she was always calling to see how he was; calling on me to suggest that I should see him, if he did not seem so well, and not failing to ask his landlady if he had all he needed. She was herself old. She had spent thirty years in India. Her husband was in poor health. But she always found time to think of the 'Professor,' as she always called him.

In spite of his years, Wharton Jones was still fundamentally a tenderhearted, sentimental Celt [a Cymric Celt] of volcanic temperament. Tears still came readily into his eyes, and Mrs. Shaw was quite sure that there had been a disappointment in his early days, and that he had sacrificed his hopes to the needs of his relatives. His voice softened when he spoke of his brother, but became surprisingly emphatic when he spoke of scientific subjects. I was warned by Mr. Hue, when he proposed to introduce me to him, not to mention such matters, as he was apt to get somewhat hot in speaking of them, and long afterwards, when referring to text-books of physiology just published, he exploded. 'These physiologists they EXCOGITATE! They excogitate!' "

Dr. Robertson inherited, amongst other things, Jones's microscopes, one of which he has presented to the Royal Society of Medicine. It is a quaint little instrument, packed in a flat mahogany box  $5\frac{1}{2}$  inches long by  $4\frac{1}{2}$  inches broad. The stem screws into the middle of the box-lid. It has only one power. It has evidently been much used. The other was a good microscope of English make with movable stage, two eye-pieces and three objectives ( $\frac{1}{4}$ -inch,  $\frac{1}{8}$ -inch and  $\frac{1}{10}$ -inch), so he was as well equipped for his investigations as most of his contemporaries.

One wonders whether he had out his microscopes to verify his old observations or whether it was only in fancy that he "fought all his battles o'er again." Certainly he was not idle. His historical studies alone must have kept him busy and yet he found time to send no less than eleven communications to the "Lancet" between 1883 and 1889.



Their titles show how his mind was working; their substance that he was still alive to what was going on in the medical world, and more than sceptical about the methods and the accuracy of the "Professors" of the day. The list is not long and shall be given in full.

1883. "Observations on death from obstruction of the circulation through the lungs occasioned by Fibrinous Clots in the Pulmonary Artery."

1884. "Alleged emigration of white blood corpuscles from the interior of small vessels by boring through their walls." In this he expresses complete disbelief in the accuracy of Cohnheim's discovery; and says that what two Professors shewed him was not emigration at all, but something which he had himself seen and described long before.

1884. "Dilation of the calibre of small arteries."

1885. "Remarks on the circulation of the blood."

1885. "On the ova of mammifera before and after Fecundation."

1885. "Mechanism of the action of the Heart."

In the same year he began a series of polemical papers which in characteristic fashion restate his confidence in the accuracy of his own work and hurl defiance at his opponents.

1885. "Proceedings calculated to impede the progress of scientific knowledge of facts in Nature."

1886. "The Darwinian working hypothesis examined physiologically."

1886. "Peroration to my reminiscences of fifty years' struggle in the footsteps of William Harvey to search out crucial facts in physiology."

1887. "The white corpuscle of the Blood. A supplement to my remonstrance addressed to Professors of Physiology against teaching in their writings, lectures, or occasional orations that white corpuscles of the blood emigrate from the interior of small vessels until they have verified it by actual observation of their own as a fact in Nature."

And finally, in 1889, "On the state of the circulation in the extreme vessels in atropine and cocaine poisoning." This was a supplement to his paper of July, 1885, and explains by references to his old work the appearances which had been reported as being present in atropine and cocaine poisoning. Amongst other things, he says that atropine does not dilate the pupil of a bird because birds have no *dilatator iridis*. The paper also contains his last word on the emigration of the white corpuscles, and it is characteristic of the man that he never swerved from the position he took up with regard to Cohnheim's discovery.

But this was not the end of his literary labours. In 1891, the



year of his death, he published a Report\* (already referred to at page 15) which recapitulates, in the course of about seventy pages, all his work on the circulation, and all his opinions about the work of others in this field. Those who have not the opportunity to read his earlier writings may with advantage study this report, only they must bear in mind the circumstances in which it was written, the age of the author and some points in his character which I have tried to make clear. There is no need to describe it here in detail, but the "advertisement" shall be quoted to show the frame of mind in which it was written. "The following pages are respectfully addressed to the General Council of Medical Education—Universities and their Colleges—Colleges of Physicians, Colleges of Surgeons, and all other Authorities, who may consider the faithful instruction of Students of Medicine in a real knowledge of the phenomena of the Circulation of the Blood to be of paramount importance." Not yet—he seems to say—do I see any sign of the Professors coming round to my views; but yet he does not despair, for on the title page we read these strange but hopeful verses :

"In yonder world, I do believe,  
That Truth they still maintain;  
But with the lies that here prevail,  
Our Marshal fights in vain."

—*Bismarck.*

"Sham fails,  
Truth prevails."

—*Moltke.*

He passed away, full of years, without any definite illness on Nov. 28, 1891, waving his standard almost to the last. I think it was the fighting spirit that deprived him of the meed of praise that was certainly his due. The mischief of most scientific contests is that they are waged not against a common foe but are disputes amongst allies as to the best method of advance. Jones was too apt, not only to maintain his own view with fervour, but to disparage overmuch the opinions of others, and when it was all settled, to complain that the soundness of his views was either grudgingly recognized or not recognized at all. Often, no doubt, the complaint was justified, but this was not the way to conciliate rivals or to cement friendships.

He lived so long after the close of his active career that few of his fellow workers survived him, and his departure was scarcely observed. We have referred to Sir John Tweedy's excellent obituary notice in the "Lancet," but his name does not appear in the Dictionary of National Biography—it was one of the overlooked,

---

\* "Report on the state of the blood and the blood-vessels in inflammation, and on other points relating to the circulation in the extreme vessels: together with a report on lymphatic hearts and on the propulsion of lymph from them, through a proper duct, into their respective veins." London: Baillière, Tindall, and Cox. 1891.



*caruit quia vate sacro.* And now it seems strange that this belated memoir should appear in an Ophthalmological Journal, because, though he was a great ophthalmologist, it is really as a physiologist that his name should go down to posterity. But how few there are, even amongst the most brilliant cultivators of this shifting science, whose names will be remembered. Their records are written on the seashore, and only a few beyond the wash of the tides. So small a proportion of "physiological facts" are permanent, and these are so soon overshadowed by exciting new discoveries, that their discoverers are often forgotten. It is hoped that these pages may help to recall the fact that Wharton Jones's name is not the least worthy amongst this noble band of pioneers.

His private life, as far as we know anything about it, presents a somewhat low-toned picture. He seems to have missed, by so little, much that might have made him happy and successful. But this little made all the difference. Doubtless, when absorbed in scientific work, his troubles were, for a time, forgotten; doubtless in early middle age, when his reputation was European, he enjoyed the appreciation of his teaching and the prospect of a brighter future than that which was in store for him; doubtless, also, his polemics were not altogether distasteful to him; but, when all is said, it is impossible to believe that, on the whole, he had more than a very moderate share of happiness or even of contentment.

#### BIBLIOGRAPHY

1. Tiedemann, F.—"Plates of the arteries of the human body." Engraved by E. Mitchell under the superintendency of Thomas Wharton Jones. 4to. Edinburgh: Maclachlan & Stewart. 1829.
2. "On the double type of the respiratory organs, as illustrated by Professor Rathke's discoveries." *Edinb. Journ. Nat. Geogr. Sci.*, Vol. II, 1830, pp. 173-176.
3. "Description of the eye of the cuttlefish (*loligo sagittata*)." *Edinb. Journ. Nat. Geogr. Sci.*, Vol. III, 1831, pp. 285-287.
4. "Manual of Pharmacology; or compendium of materia medica, conspectus of the London, Edinburgh and Dublin Pharmacopoeias, and formulary of extemporaneous prescriptions." Edinburgh: Maclachlan & Stewart; London: Baldwin and Cradock, 1833.
5. "Notice relative to the pigmentum nigrum of the eye." *Edinb. Med. Surg. Journ.*, Vol. XL, 1833, pp. 77-83.
6. "On the motions of the pupil." *Edinb. Med. Surg. Journ.*, Vol. XLI, 1834, pp. 40-42. *Frorieps Notizen*, Vol. XXXIX, 1834, col. 276-288.
7. "Confirmation of Purkinje's discovery of vibratory motions." *Dublin Journ. Med. Chem. Sci.*, Vol. VII, 1835, p. 498.
8. "On the ova of women and mammiferous animals, as they exist in the ovaries before impregnation; and on the discovery in them of a vesicle analagous to that described by Professor Purkinje in the mature egg of the bird (abstract)." *Proc. Roy. Soc.*, Vol. III, 1835, pp. 339-340. (Complete paper in *Lond. Med. Gazette*, 1838, n.s. i, pp. 680-688.)



9. "On the retina and pigment of the eye of the common calamary (*sepia loligo*).'' *Phil. Mag.*, Vol. VIII, 1836, pp. 1-3 ; *Frorieps Notizen*, Vol. XLVIII, 1836, col. 2-5.
10. "On the first changes in the ova of the mammifera in consequence of impregnation and on the mode of origin of the chorion.'' *Phil. Trans.*, 1837, pp. 339-346.
11. "On the mode of closure of the gill-apertures in the tadpoles of Batrachia.'' *Proc. Zool. Soc.*, Vol. V, 1837, p. 38.
12. "On the so-called choroid gland or choroid muscle of the fish's eye.'' *Lond. Med. Gaz.*, 1838, n.s. i, p. 650.
13. "On the first changes in the ova of the mammifera in consequence of impregnation, and on the mode of origin of the chorion.'' *Lond. Med. Gaz.*, 1838, n.s. i, pp. 719-724.
14. "Some observations on the pathology of staphyloma.'' *Lond. Med. Gaz.*, 1838, n.s. i, pp. 847-850.
15. "Observations on the ova of the mammifera, before and after impregnation, in reference to Dr. Martin Barry's 'Researches in embryology.''' *Lond. Med. Gaz.*, 1839.
16. "Observations on single vision with two eyes.'' *Proc. Roy. Soc.*, Vol. IV, 1840, pp. 198-199.
17. "On the ova of man and mammiferous animals.'' *Proc. Roy. Soc.*, Vol. IV, 1840, pp. 248-249.
18. "Diseases of the ear and hearing.'' From the "Cyclopedia of Practical Surgery." London : Gilbert & Rivington, 1841.
19. "Observations on some points in the anatomy, physiology and pathology of the blood.'' *Brit. and For. Med. Rev.*, Vol. XIV, 1842, pp. 585-600.
20. "Observations on the blood corpuscles, particularly with reference to opinions expressed and conclusions drawn in papers, 'On the corpuscles of the blood' and 'On Fibre,' recently published in the *Philosophical Transactions*," *Proc. Roy. Soc.*, Vol. IV, 1842, pp. 429-432 ; *Frorieps Notizen*, Vol. XXVI, 1843, col. 292-293 ; *Phil. Mag.*, Vol. XXII, 1843, pp. 480-487.
21. "On the distinction between healthy and buffy blood in minute quantities.'' *Edinb. Med. Surg. Journ.*, Vol. LX, 1843, pp. 309-311.
22. "Report on the ovum of man and the mammifera before and after fecundation.'' *Brit. and For. Med. Rev.*, Vol. XVI, 1843, pp. 513-557 ; and reprinted as a pamphlet.
23. "Appareil névro-magnétique des muscles.'' (Translated from *Med. Gaz.*) *Annal. de Chimie*, Vol. X, 1844, pp. 111-113.
24. "Report on the present state of knowledge of the nature of inflammation.'' *Brit. and For. Med. Rev.*, Vol. XVII, 1844, pp. 567-586.
25. "Report on the changes in the blood in inflammation and on the nature of the healing process.'' *Brit. and For. Med. Rev.*, Vol. XVIII, 1844, pp. 255-280.
26. "Ueber das Corpus luteum.'' (Translated.) *Frorieps Notizen*, Vol. XXX, 1844, col. 38-40.
27. "The blood-corpuscle considered in its different phases of development in the animal series. Mem. I, Vertebrata ; Mem. II, Invertebrata ; Mem. III, Comparison between the blood-corpuscle of the vertebrata and the invertebrata (1845).'' *Phil. Trans.*, 1846, pp. 63-88, 89-102, 103-106 ; *Frorieps Notizen*, Vol. XXXVI, 1846, col. 38-40 ; *Amer. Journ. Sci. and Arts*, 2 ser. I, 1846, pp. 128-129.
28. "A manual of the principles and practice of ophthalmic medicine and surgery.'' London : John Churchill, 1847. Second edition 1855 ; third edition 1865. (The title of the second and third editions is "A treatise on the principles and practice of ophthalmic medicine and surgery.")
29. The same, American edition. Philadelphia : Lea & Blanchard, 1847 ; second edition 1856 ; third edition 1863.



30. "Microscopical examination of the contents of the hepatic ducts, with conclusions founded thereon as to the physiological signification of the cells of hepatic parenchyma and as to their anatomical relation to the radicles of the hepatic ducts." *Phil. Trans.*, 1848, pp. 276-280.
31. "On the state of the blood and the blood-vessels in inflammation, ascertained by experiments, injections and observations by the microscope." *Guy's Hosp. Rep.*, Vol. VII, 1851, pp. 1-94 (the Astley Cooper prize essay).
32. "The wisdom and beneficence of the Almighty as displayed in the sense of vision. (The Actonian prize essay for 1851.) London: John Churchill, 1851.
33. "Discovery that the veins of the bat's wing (which are furnished with valves) are endowed with rhythmical contractility, and that the onward flow of blood is accelerated by each contraction." *Phil. Trans.*, 1852, pp. 131-136.
34. "On the state of the blood and the blood-vessels in inflammation, ascertained by experiments, injections and observations by the microscope." *Med. Chir. Trans.*, Vol. XXXVI, 1853, pp. 391-402.
35. "Blood-corpuscule-holding cells." (Review). *Brit. and For. Med. Chir. Rev.*, Vol. XI, 1853, pp. 32-38.
36. "Report on the ophthalmoscope." *Brit. and For. Med. Chir. Rev.*, Vol. XIV, 1854, pp. 549-557.
37. "Defects of sight, their nature, causes, prevention and general management." London: John Churchill, 1856.
38. The same. Edited, with additions, by Lawrence Turnbull, Philadelphia. C. J. Price & Co., 1859.
39. "A catechism of the medicine and surgery of the eye and ear." London: John Churchill, 1857.
40. "A catechism of the physiology and philosophy of body, sense and mind." London: John Churchill, 1858.
41. "Analysis of my sight, with a view to ascertain the focal power of my eyes for horizontal and for vertical rays, and to determine whether they possess a power of adjustment for different distances." *Pro. Roy. Soc.*, Vol. X, 1859-60, pp. 380-385.
42. "On the invention of stereoscopic glasses for single pictures with preliminary observations on the stereoscope and the physiology of stereoscopic vision." London: John Churchill, 1860.
43. "Traité pratique des maladies des yeux; traduit de l'anglais avec des additions et des notes par M. Foucher." Paris: F. Chamerot, 1862.
44. "The caudal heart of the eel a lymphatic heart. Effect of the force with which the lymph-stream is propelled therefrom on the flow of the blood in the vein into which the heart opens. Explanation of the appearance of blood propelled in successive drops as if from the heart along the caudal vein. Influence which the force of the lymph-stream from the heart exerts in accelerating and promoting the flow of blood in the caudal vein." (1867). *Phil. Trans.*, Vol. CLVIII, 1868, pp. 675-683; *Proc. Roy. Soc.*, Vol. XVI, 1868, pp. 230-231.
45. "On the phenomena observed to attend the propulsion of lymph from one of the lymphatic hearts into a vein in the frog." *Proc. Roy. Soc.*, Vol. XVI, 1868, pp. 335-336.
46. "Microscopical characters of the rhythmically contractile muscular coat of the veins of the web of the bat's wings." *Proc. Roy. Soc.*, Vol. XVI, 1868, p. 342.
47. "Microscopical characters of the rhythmically contractile muscular coat of the lymphatic hearts of the frog." *Proc. Roy. Soc.*, Vol. XVI, 1868, p. 342-343.
48. "Microscopical characters of the rhythmically contractile muscular coat of the caudal heart of the eel." *Proc. Roy. Soc.*, Vol. XVI, 1868, p. 343.
49. "Failure of sight from railway and other injuries of the spine and head; its nature and treatment, with a physiological and pathological disquisition into the influence of the vaso-motor nerves on the circulation of the blood in the extreme vessels." London: James Walton, 1869.



50. "A true relation of the life and death of the Right Reverend Father in God, William Bedell, Lord Bishop of Kilmore, in Ireland." Printed for the Camden Society, 1872.
51. "The pedigree of Alliston or Elliston, of Essex and Kent." *The Herald and Genealogist*, Vol. V.
52. "Evolution of the human race from apes and of apes from the lower animals : a doctrine unsanctioned by science." London : Smith, Elder & Co., 1876.
53. "Clinical study of the diseases of the eye." *Lancet*, 1881, Vol. I, p. 2.
54. "Pathology of the obstruction of the circulation of the blood in the lungs." *Lancet*, 1881, Vol. I, p. 403.
55. "Action of belladonna." *Brit. Med. Journ.*, 1881, Vol. II, p. 93.
56. "Observations on death from obstruction of the circulation through the lungs, occasioned by fibrinous clots in the pulmonary artery." *Lancet*, 1883, Vol. I, p. 52.
57. "Alleged emigration of white blood corpuscles from the interior of small vessels by boring through their walls." *Lancet*, 1884, Vol. II., p. 631.
58. "Dilation of the calibre of small arteries." *Lancet*, 1884, Vol. II, p. 864.
59. "Remarks on the circulation of the blood," *Lancet*, 1885, Vol. I, p. 99, p. 146, Vol. II, p. 105, p. 146.
60. "On the ova of man and the mammifera before and after fecundation." *Lancet*, 1885, Vol. II, p. 203, p. 332.
61. "Proceedings calculated to impede the free progress of a scientific knowledge of facts in Nature." *Lancet*, 1885, Vol. II, p. 943.
62. "Mechanism of the action of the heart." *Lancet*, 1885, Vol. II, p. 1131, p. 1179.
63. "The Darwinian working hypothesis of evolution examined physiologically." *Lancet*, 1886, Vol. I., p. 341.
64. "Peroration to my reminiscences of fifty years' struggle in the footsteps of William Harvey to search out crucial facts in physiology." *Lancet*, 1886, Vol. II, p. 162.
65. "The white corpuscles of the blood." *Lancet*, 1887, Vol. I, p. 164.
66. "Rule in Ireland from St. Patrick to Cromwell." Ventnor, I.W.: R. Medley, 1887.
67. "On the state of the circulation in the extreme vessels in atropine and cocaine poisoning." *Lancet*, 1889, Vol. II, p. 309.
68. "Report on the state of the blood and the blood-vessels in inflammation, and on other points relating to the circulation in the extreme vessels : with report on lymphatic hearts and the propulsion of lymph from them through a proper duct into their respective veins." London : Baillière, Tindall & Cox, 1891.























